

FIG.1

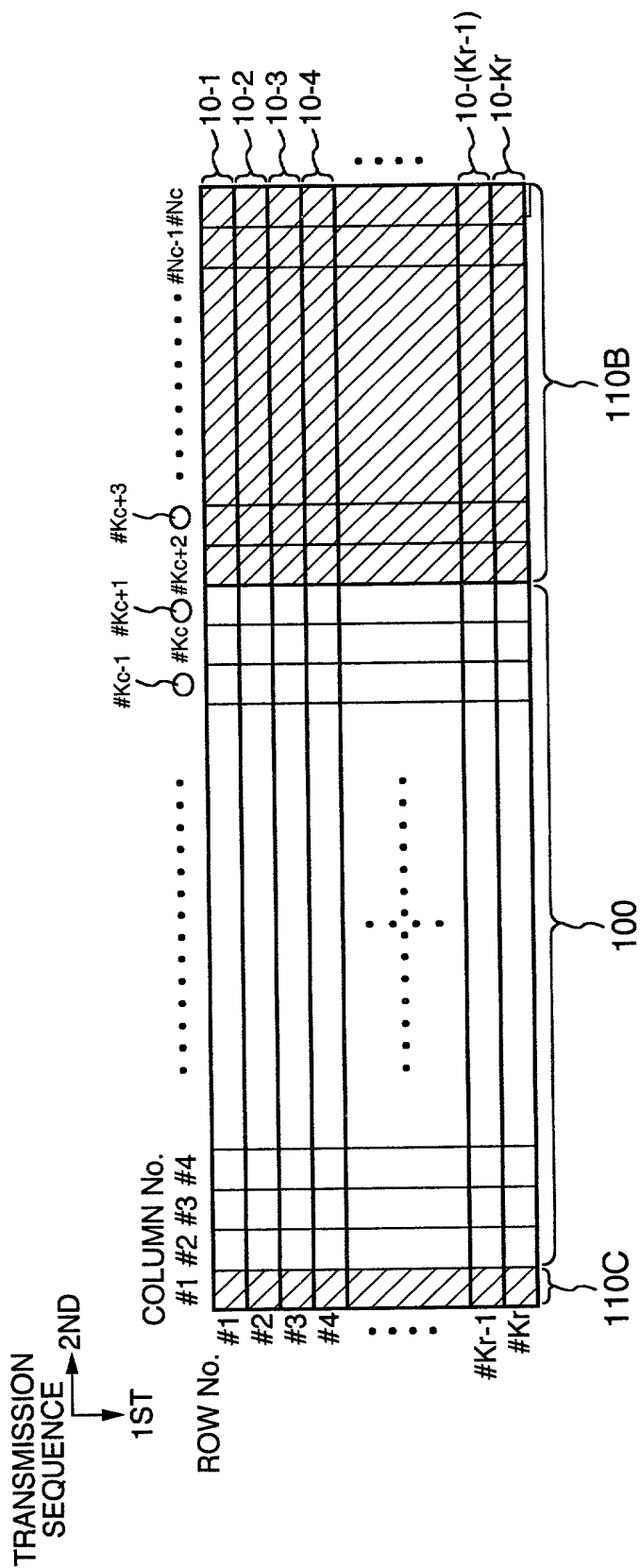


FIG.2

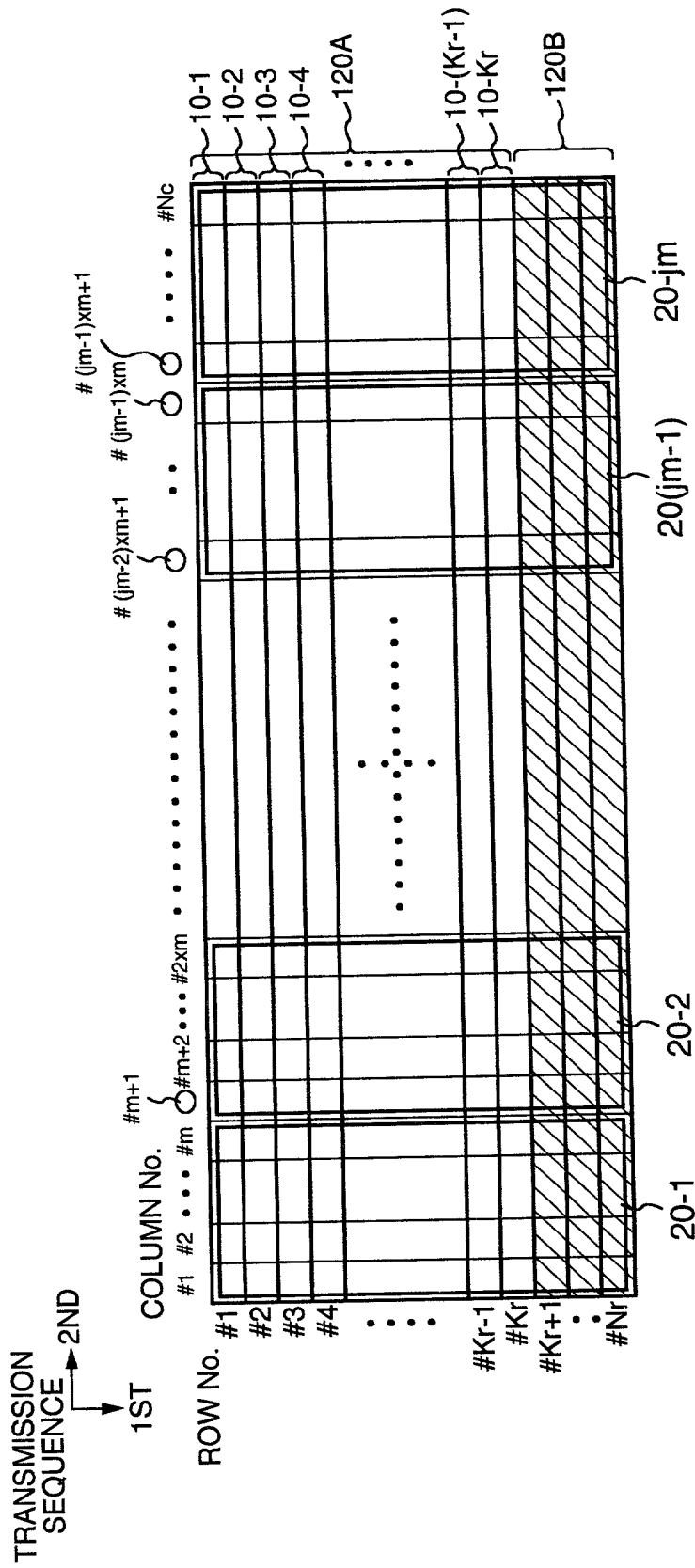


FIG.3

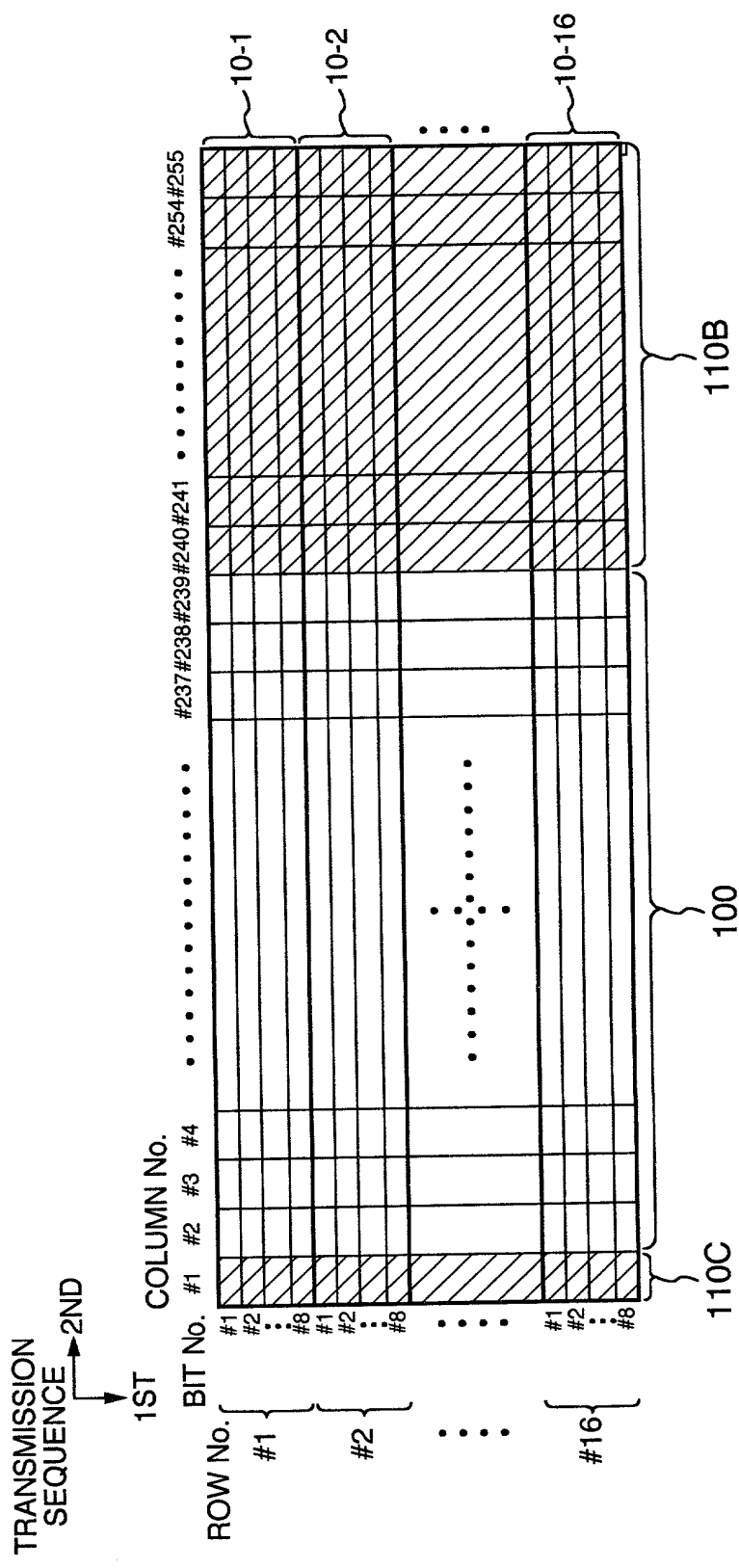




FIG.5

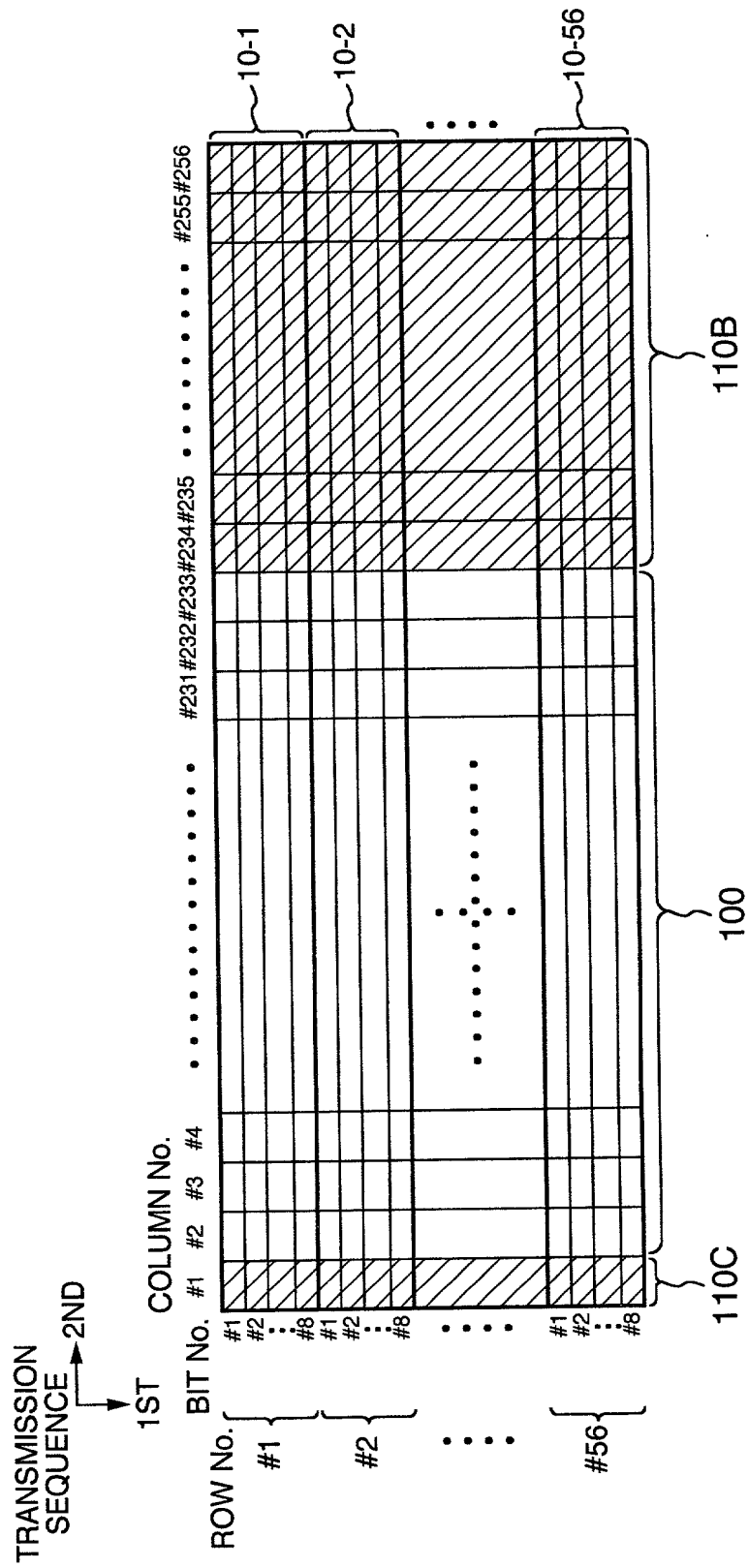


FIG. 6

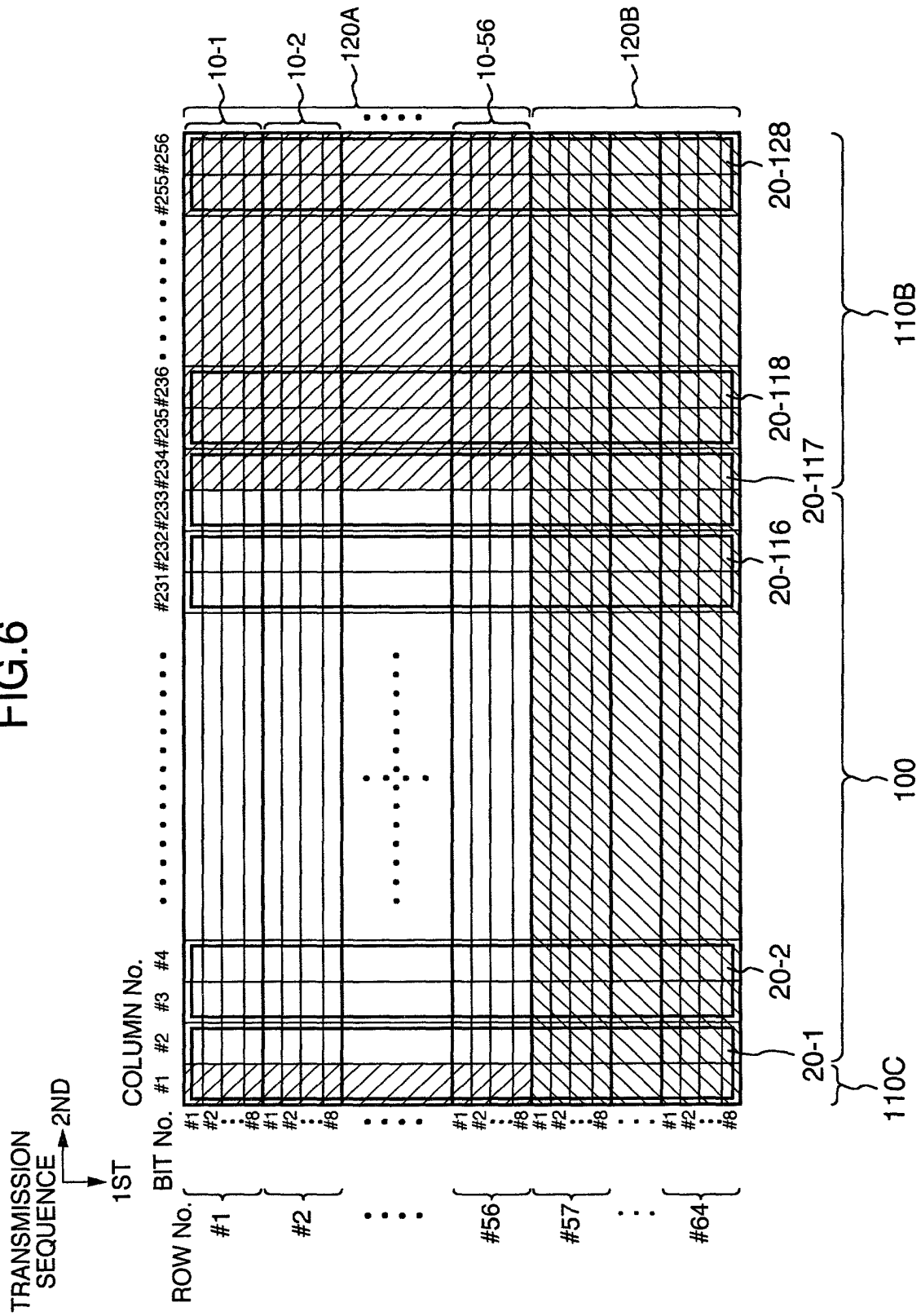




FIG.8

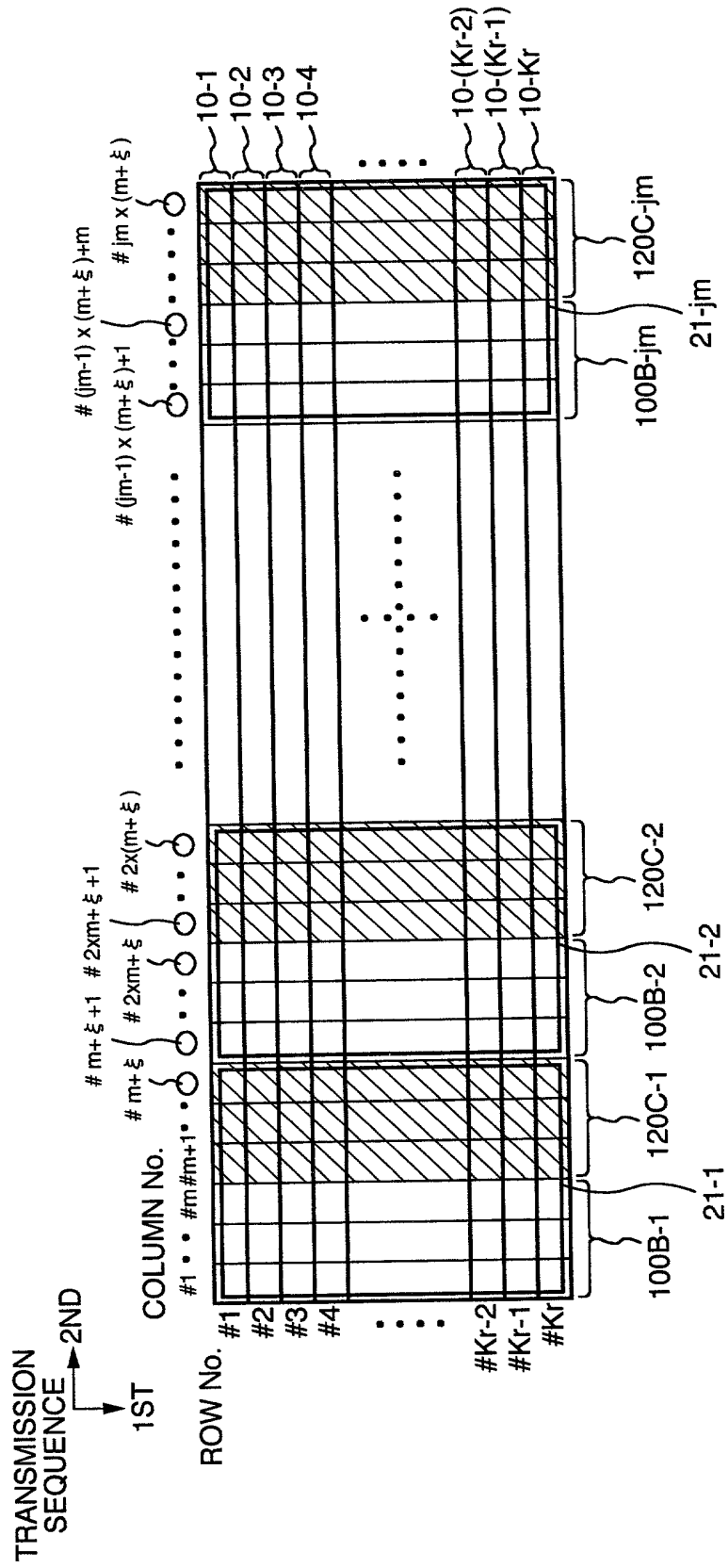




FIG.9A

Nc	Kc	C1 code
256	252	RS-1 code (255,253) or BCH-2 code (2047,2025) on GF (2048)
	248	RS-3 code (255,249) or BCH-5 code (2047,1992) on GF (2048)
	244	RS-5 code (255,245) or BCH-7 code (2047,1970) on GF (2048)
	240	RS-7 code (255,241) or BCH-10 code (2047,1937) on GF (2048)
	238	RS-8 code (255,239) or BCH-12 code (2047,1915) on GF (2048)
	236	RS-9 code (255,237) or BCH-13 code (2047,1904) on GF (2048)
	232	RS-11 code (255,233) or BCH-16 code (2047,1871) on GF (2048)
	228	RS-13 code (255,229) or BCH-19 code (2047,1838) on GF (2048)
	224	RS-15 code (255,225) or BCH-22 code (2047,1805) on GF (2048)
	220	RS-17 code (255,221) or BCH-25 code (2047,1772) on GF (2048)
	216	RS-19 code (255,217) or BCH-28 code (2047,1739) on GF (2048)
	212	RS-21 code (255,213) or BCH-31 code (2047,1706) on GF (2048)
	208	RS-23 code (255,209) or BCH-34 code (2047,1673) on GF (2048)
	204	RS-25 code (255,205) or BCH-37 code (2047,1640) on GF (2048)
	200	RS-27 code (255,201) or BCH-39 code (2047,1618) on GF (2048)
255	240	RS-7 code (255,241) or BCH-10 code (2040,1930) on GF (2048)
	238	RS-8 code (255,239) or BCH-11 code (2040,1919) on GF (2048)
	225	RS-14 code (255,227) or BCH-21 code (2040,1809) on GF (2048)
	221	RS-16 code (255,223) or BCH-24 code (2040,1776) on GF (2048)
	210	RS-22 code (255,211) or BCH-32 code (2040,1688) on GF (2048)
	204	RS-25 code (255,205) or BCH-36 code (2040,1644) on GF (2048)
128	116	RS-5 code (128,118) or BCH-8 code (1023,943) on GF (1024)
	112	RS-7 code (128,114) or BCH-12 code (1023,903) on GF (1024)
	108	RS-9 code (128,110) or BCH-15 code (1023,873) on GF (1024)
	104	RS-11 code (128,106) or BCH-18 code (1023,843) on GF (1024)
	100	RS-13 code (128,102) or BCH-21 code (1023,813) on GF (1024)
64	56	RS-3 code (64,58) or BCH-6 code (511,457) on GF (512)
	54	RS-4 code (64,56) or BCH-8 code (511,439) on GF (512)
	52	RS-5 code (64,54) or BCH-9 code (511,430) on GF (512)
	50	RS-6 code (64,52) or BCH-11 code (511,412) on GF (512)
32	28	RS-1 code (32,30) or BCH-3 code (255,231) on GF (256)
	27	RS-2 code (32,28) or BCH-4 code (255,223) on GF (256)
	26	RS-2 code (32,28) or BCH-5 code (255,215) on GF (256)
	25	RS-3 code (32,26) or BCH-6 code (255,207) on GF (256)
16	15	BCH-1 code (127,120) on GF (128)
	14	BCH-2 code (127,113) on GF (128)

RS: Reed-Solomon code on GF (256)

RS/BCH-xcode x multi errors correcting RS/BCH c code

GF: Galois Field

FIG.9B

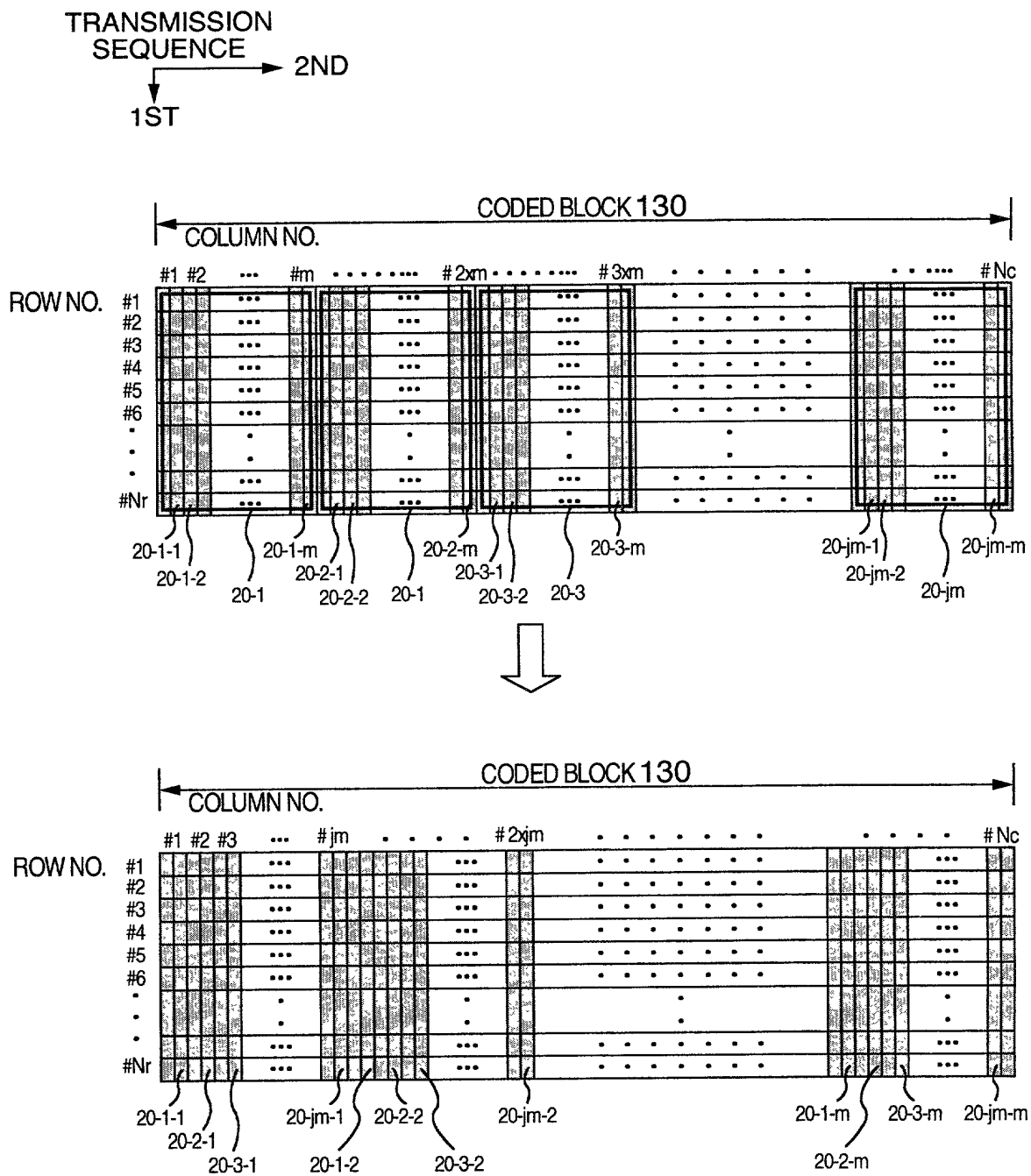
Kr	Nr	m	$\xi$	C2 code
4	5	1	—	BCH-1 code (40,34) on GF (64)
		2	—	RS-1 code (10,8) or BCH-2 code (80,66) on GF (128)
		4	—	RS-2 code (20,16) or BCH-4 code (160,128) on GF (256)
		8	—	RS-4 code (40,32) or BCH-7 code (320,257) on GF (512)
7	8	1	—	BCH-1 code (63,57) on GF (64) or Convolutional code with coding rate of 7/8
		2	—	RS-1 code (16,14) or BCH-2 code (127,113) on GF (128)
		4	—	RS-2 code (32,28) or BCH-3 code (255,231) on GF (256)
		8	—	RS-4 code (64,56) or BCH-7 code (511,448) on GF (512)
8	9	1	—	BCH-1 code (72,65) on GF (128)
		2	—	RS-1 code (18,16) or BCH-2 code (144,128) on GF (256)
		4	—	RS-2 code (36,32) or BCH-3 code (288,261) on GF (512)
		8	—	RS-4 code (72,64) or BCH-6 code (576,516) on GF (1024)
	10	1	—	RS-1 code (10,8) or BCH-2 code (80,66) on GF (128)
		2	—	RS-2 code (20,16) or BCH-4 code (160,128) on GF (256)
		4	—	RS-4 code (40,32) or BCH-7 code (320,257) on GF (512)
		8	—	RS-8 code (80,64) or BCH-12 code (640,520) on GF (1024)
14	15	16	—	RS-8 code (240,224) or BCH-11 code (1920,1799) on GF (2048)
		17	—	RS-8 code (255,239) or BCH-12 code (2040,1908) on GF (2048)
	16	1	—	RS-1 code (16,14) or BCH-2 code (127,113) on GF (128)
		2	—	RS-2 code (32,28) or BCH-3 code (255,231) on GF (256)
		4	—	RS-4 code (64,56) or BCH-7 code (511,448) on GF (512)
		8	—	RS-8 code (128,112) or BCH-12 code (1023,448) on GF (1024)
15	16	16	—	RS-15 code (255,225) or BCH-23 code (2047,1794) on GF (2048)
		1	—	BCH-1 code (127,120) on GF (128)
		2	—	RS-1 code (32,30) or BCH-1 code (255,247) on GF (256)
		4	—	RS-2 code (64,60) or BCH-3 code (511,484) on GF (512)
		8	—	RS-4 code (128,120) or BCH-6 code (1023,963) on GF (1024)
		16	—	RS-7 code (255,241) or BCH-11 code (2047,1926) on GF (2048)
16	17	1	—	BCH-1 code (136,128) on GF (256)
		2	—	RS-1 code (34,32) or BCH-1 code (272,263) on GF (512)
		4	—	RS-2 code (68,64) or BCH-3 code (544,514) on GF (1024)
		8	—	RS-4 code (136,128) or BCH-5 code (1088,1033) on GF (2048)
	18	1	—	RS-1 code (18,16) or BCH-2 code (144,128) on GF (256)
		2	—	RS-2 code (36,32) or BCH-3 code (288,261) on GF (512)
		3	—	RS-3 code (54,48) or BCH-5 code (432,387) on GF (512)
		4	—	RS-4 code (72,64) or BCH-6 code (576,516) on GF (1024)
		8	—	RS-8 code (144,128) or BCH-11 code (1152,1031) on GF (2048)
		14	—	RS-14 code (252,224) or BCH-20 code (2016,1796) on GF (2048)
	19	1	—	RS-1 code (19,17) or BCH-3 code (152,128) on GF (256)
		2	—	RS-3 code (38,32) or BCH-5 code (304,259) on GF (512)
		4	—	RS-6 code (76,64) or BCH-9 code (608,518) on GF (1024)
		8	—	RS-12 code (152,128) or BCH-17 code (1216,1029) on GF (2048)
a	b	c	—	THE SAME CODE IS APPLICABLE AMONG FOUR CASES SHOWN LEFT. WHERE a,b AND c ARE ARBITRARY INTEGERS $\beta$ IS ARBITRARY DIVISOR
$a \times \beta$	$b \times \beta$	$c \div \beta$	—	
c	—	a	b	
$c \div \beta$	—	$a \times \beta$	$b \times \beta$	

RS: Reed-Solomon code on GF (256)

RS/BCH-x code x multi errors correcting RS/BCH code

GF: Galois Field

FIG.10



## TRANSMISSION

CODED BLOCK 130		NEXT CODED BLOCK 130	
FIRST ROW (130-1-1)		FIRST ROW (130-2-1)	
SECOND ROW (130-1-2)		SECOND ROW (130-2-2)	
THIRD ROW (130-1-3)		THIRD ROW (130-2-3)	
FOURTH ROW (130-1-4)		FOURTH ROW (130-2-4)	
FIFTH ROW (130-1-5)		FIFTH ROW (130-2-5)	
SIXTH ROW (130-1-6)		SIXTH ROW (130-2-6)	
•		•	
•		•	
(Nr-1)TH ROW (130-1-(Nr-1))		(Nr-1)TH ROW (130-2-(Nr-1))	
Nr-TH ROW (130-1-Nr)		Nr-TH ROW (130-2-Nr)	

130-2

[illegible]

**■ : 1ST COLUMNS OF EACH CODED BLOCKS 130**

130-2

The diagram illustrates the internal architecture of a Super FEC Signal Transmitter (2). It receives three external inputs: a CLIENT SIGNAL (200), a CLIENT SIGNAL (201), and a CLK (202). A PHASE PULSE (203) is also provided. The transmitter's internal components and their interconnections are as follows:

- Input Stage:** The CLIENT SIGNAL (200) is split into two paths. One path goes to a CLK EXT (210) block, which outputs CLK EXT (210C). The other path goes to an S/P (212) block. The CLIENT SIGNAL (201) is also split, with one path going to the S/P (212) block and the other to a CLK divider (211) block, which outputs CLK (211C).
- Processing Stage:** The S/P (212) block outputs to a 1ST FRAME RATE UP (216) block. The CLK EXT (210C) and CLK (211C) signals are also inputs to this block. The 1ST FRAME RATE UP (216) outputs to an OH INS (214) block. The CLK (211C) signal is also an input to this block. The OH INS (214) outputs to a C1 ENCODE PROCESSOR (217).
- Overhead Processor:** An OVERHEAD PROCESSOR (215) receives the CLIENT SIGNAL (200) via path 9a, the CLIENT SIGNAL (201) via path 9b, and the CLK (211C) via path 9c. It outputs to the C1 ENCODE PROCESSOR (217) via path 215a, to an OH INS (218) block via path 215b, and to a 2ND FRAME RATE UP (220) block via path 215c. The OH INS (218) also receives the CLK (211C) signal.
- Encoding and Rate Conversion:** The C1 ENCODE PROCESSOR (217) outputs to the OH INS (218), which then outputs to the 2ND FRAME RATE UP (220). The 2ND FRAME RATE UP (220) outputs to a C2 ENCODE PROCESSOR (222).
- Output Stage:** The C2 ENCODE PROCESSOR (222) outputs to a CLK RATE UP (219C) block. The CLK (211C) signal is also an input to this block. The CLK RATE UP (219C) outputs to a final CLK RATE UP (213) block, which also receives the CLK (211C) signal. The final output of the transmitter is the CLK RATE UP (213) signal.

200  
CLIENT SIGNAL

201  
CLIENT SIGNAL

CLK  $\xrightarrow{\sim}$

PHASE PULSE

250  
UPPER FEC SIGNAL

251  
SUPER FEC SIGNAL

CLK

253  
PHASE PULSE

FIG. 13

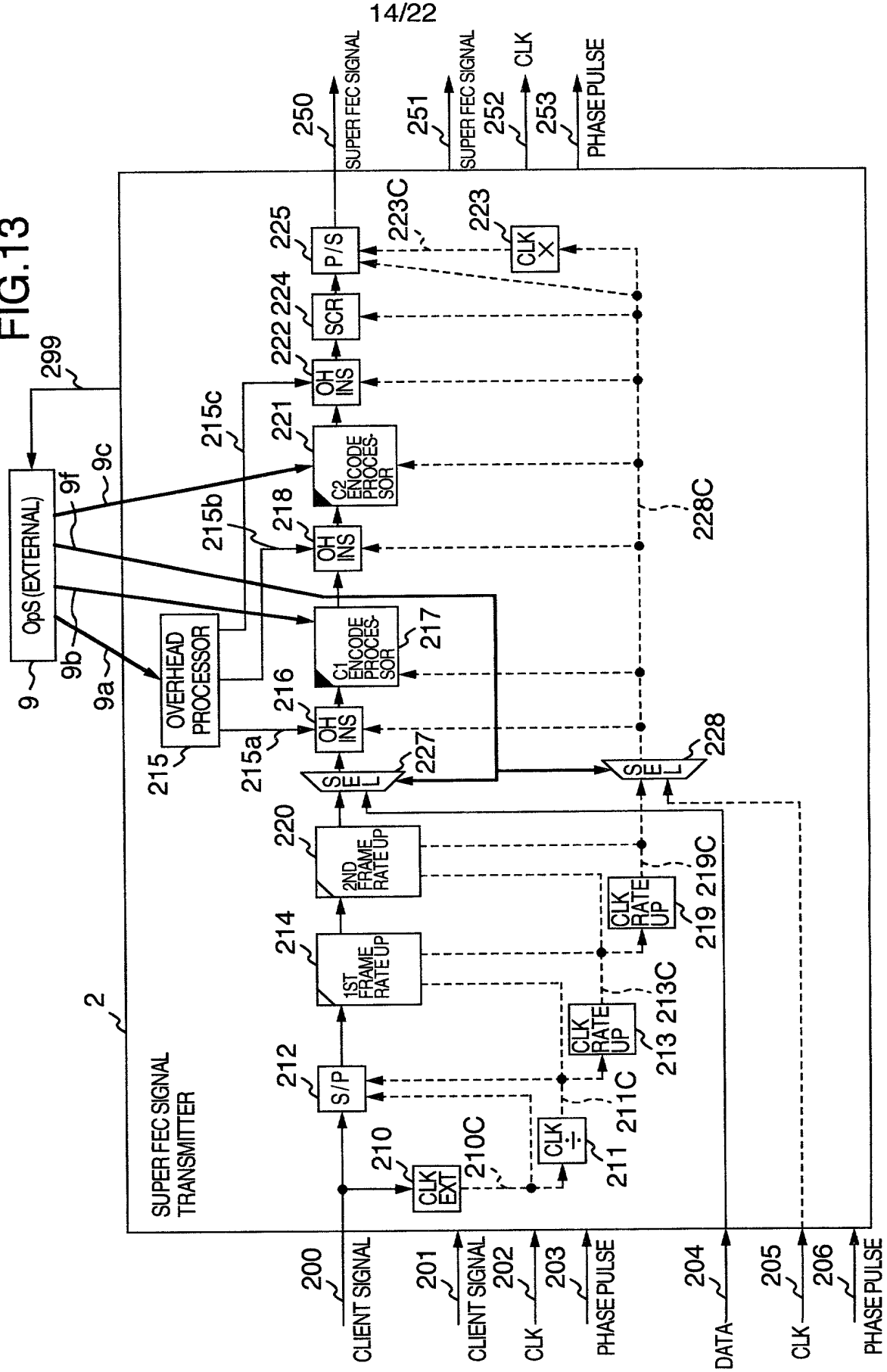


FIG. 14

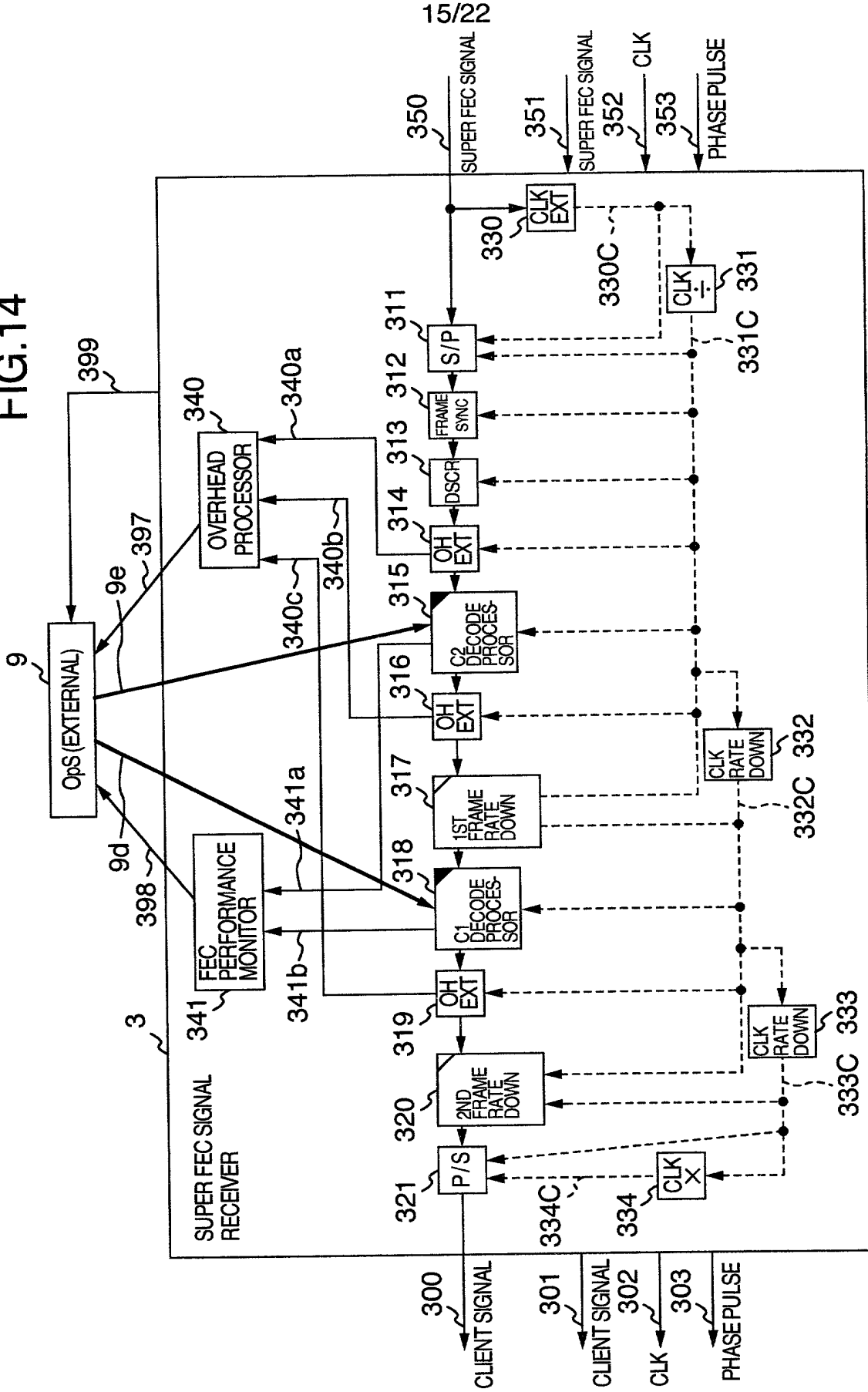


FIG.15

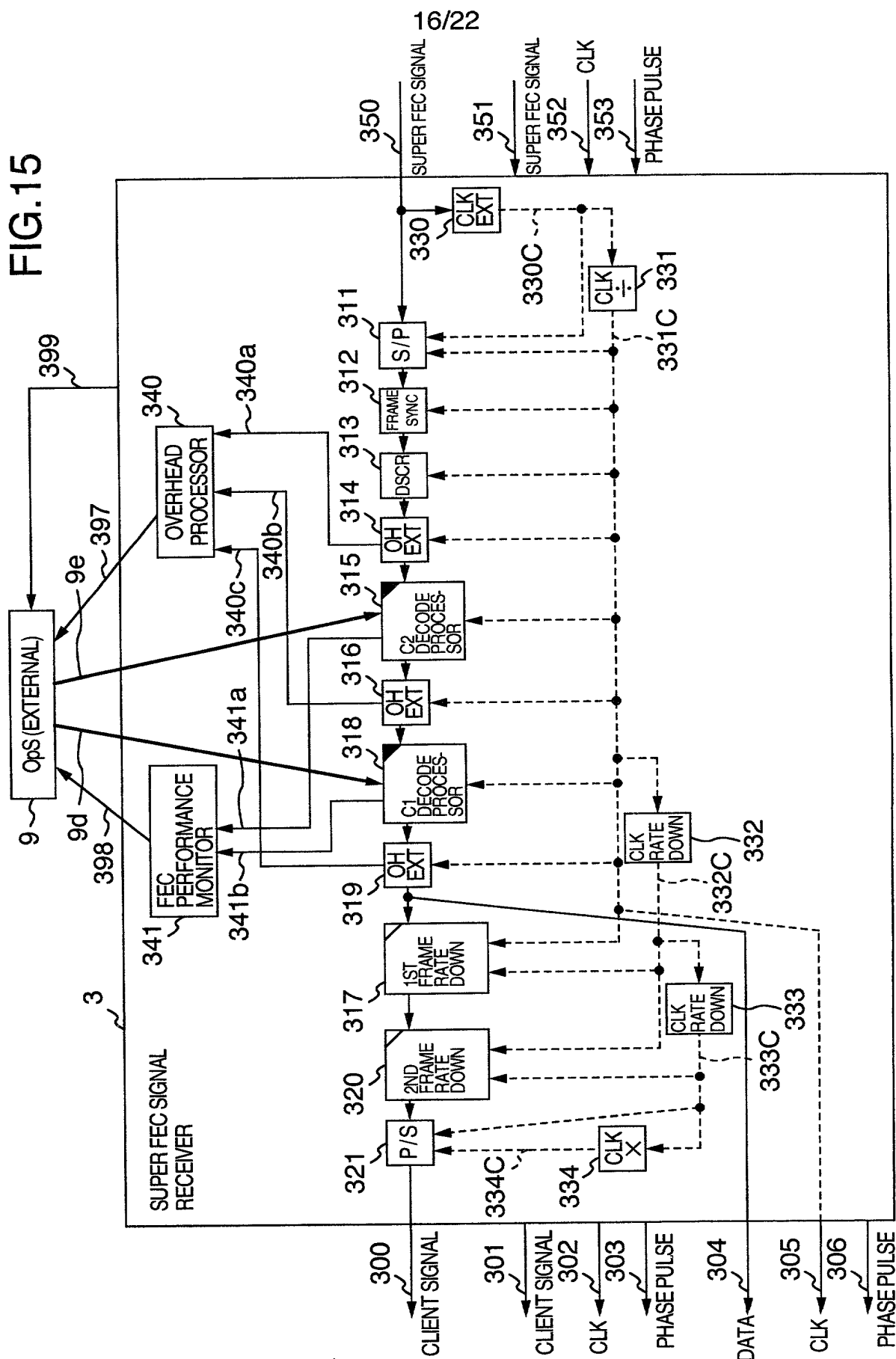




FIG.16

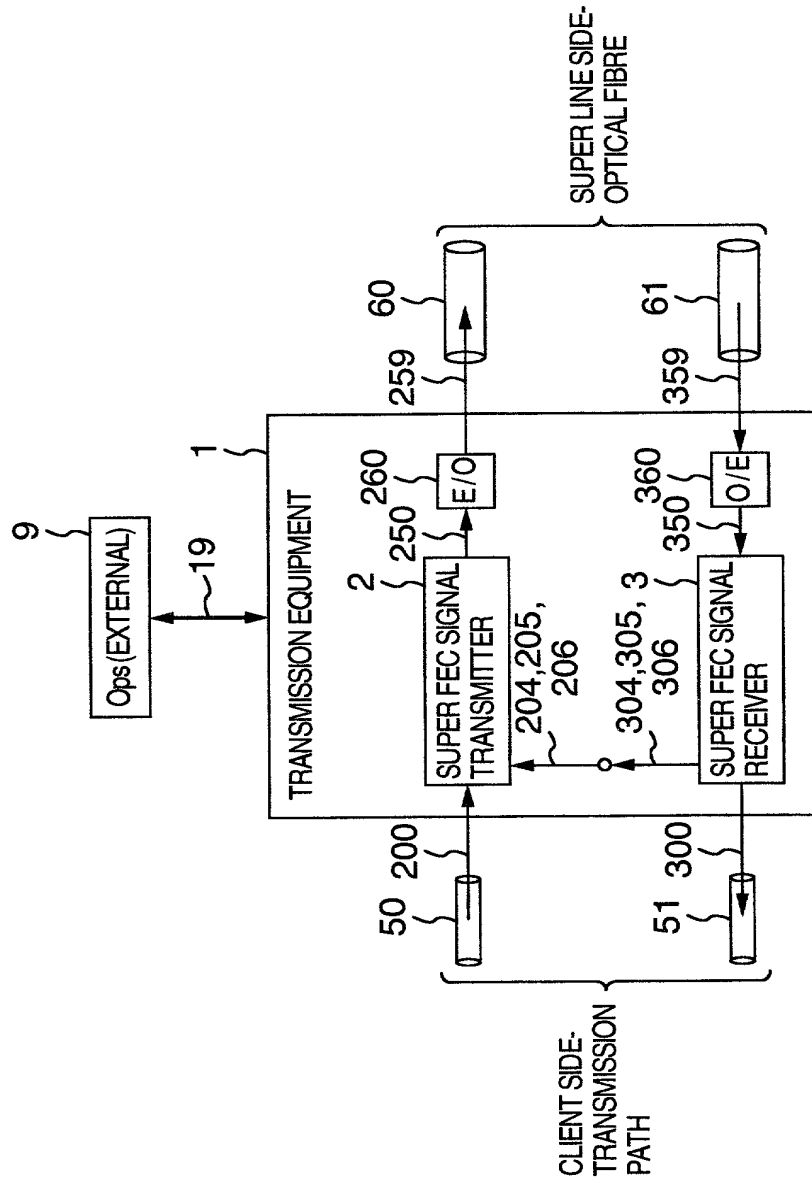


FIG.17

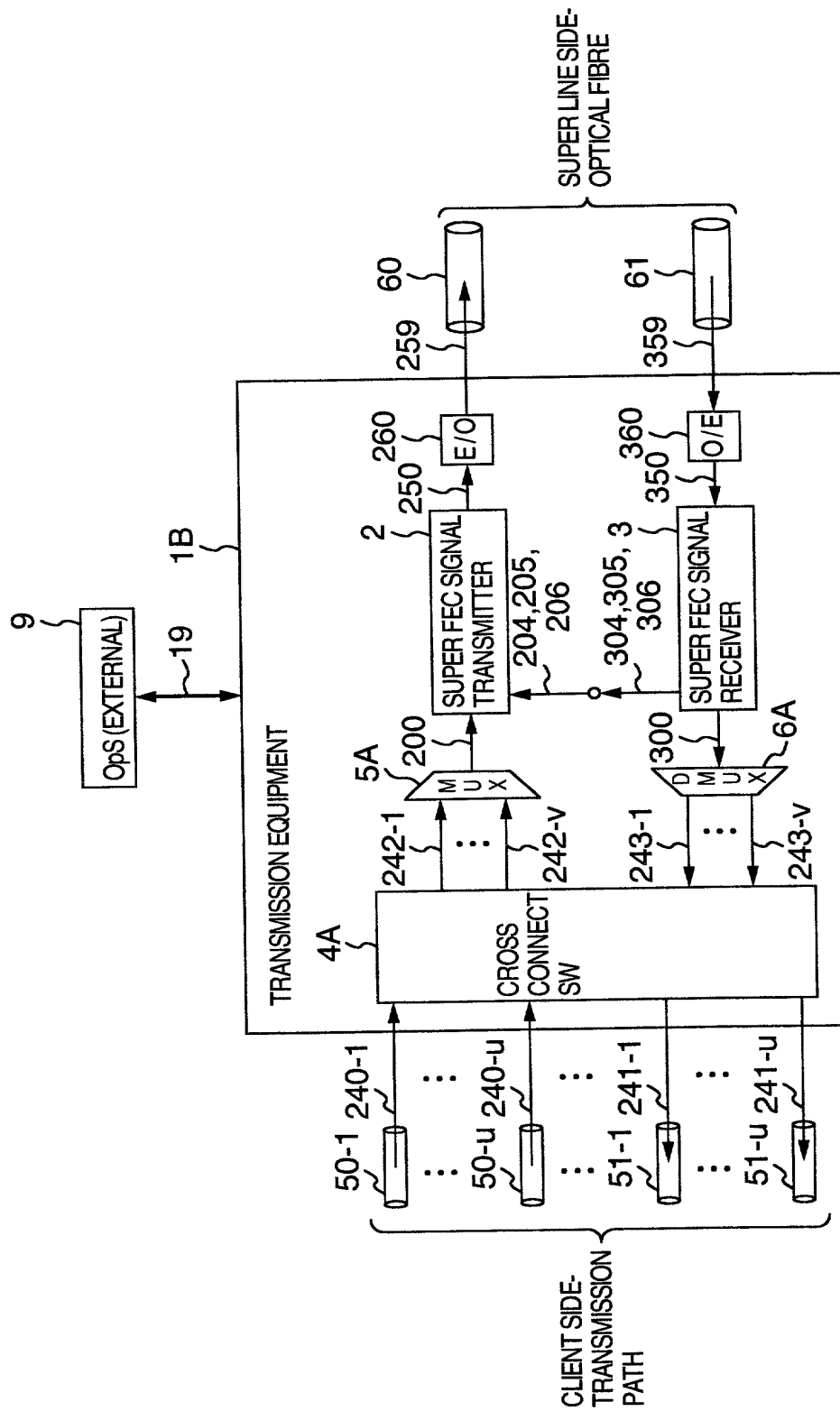


FIG.18

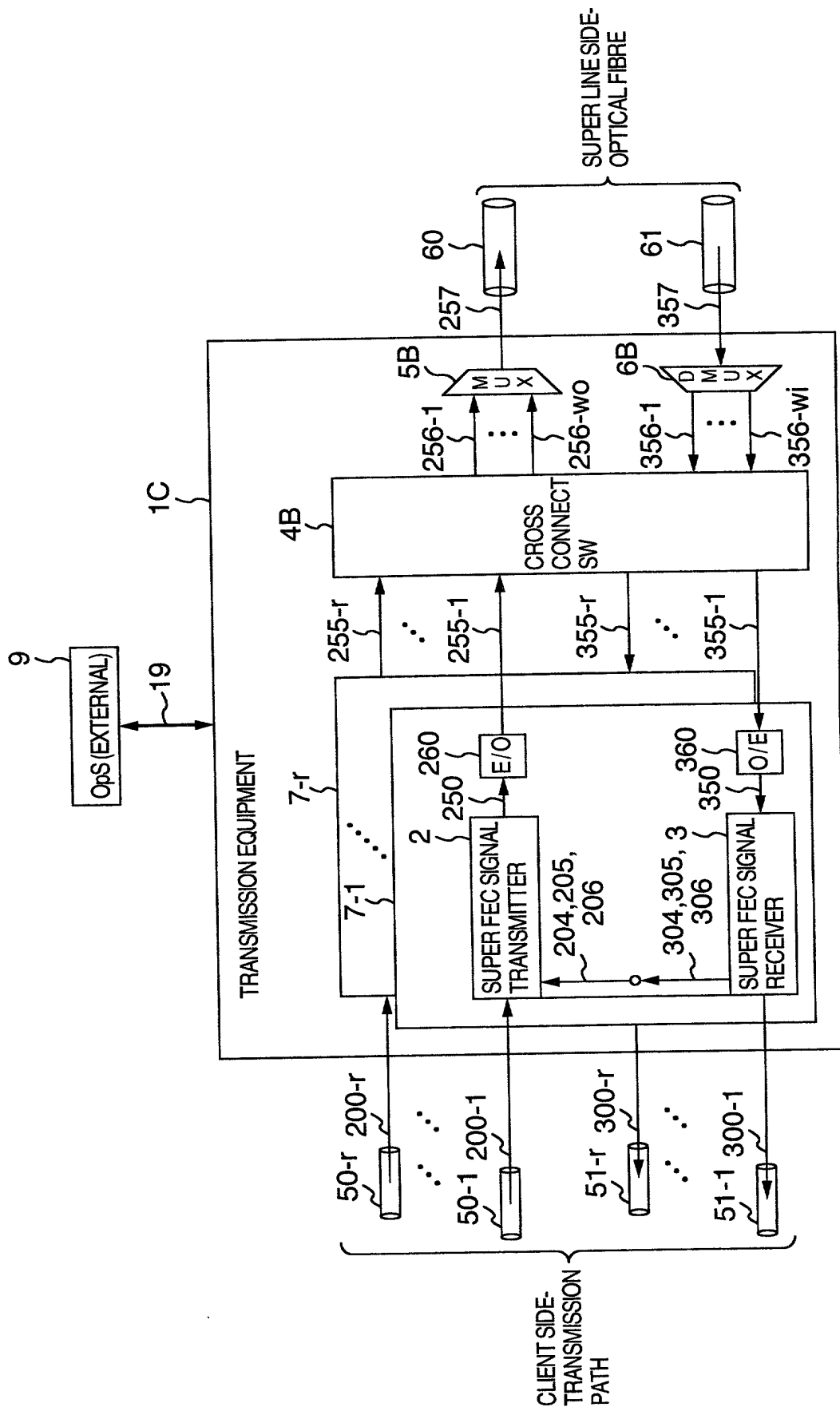


FIG. 19

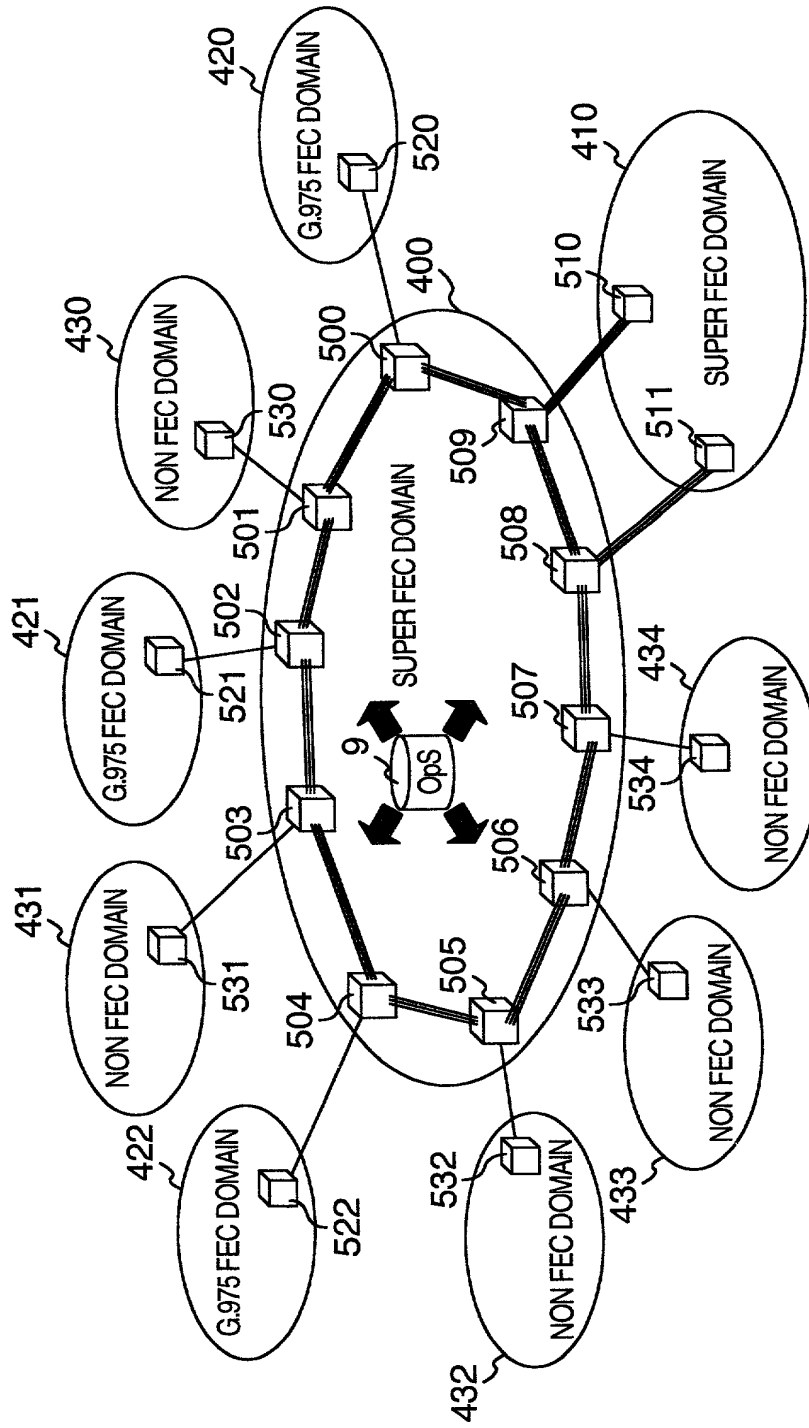


FIG.20

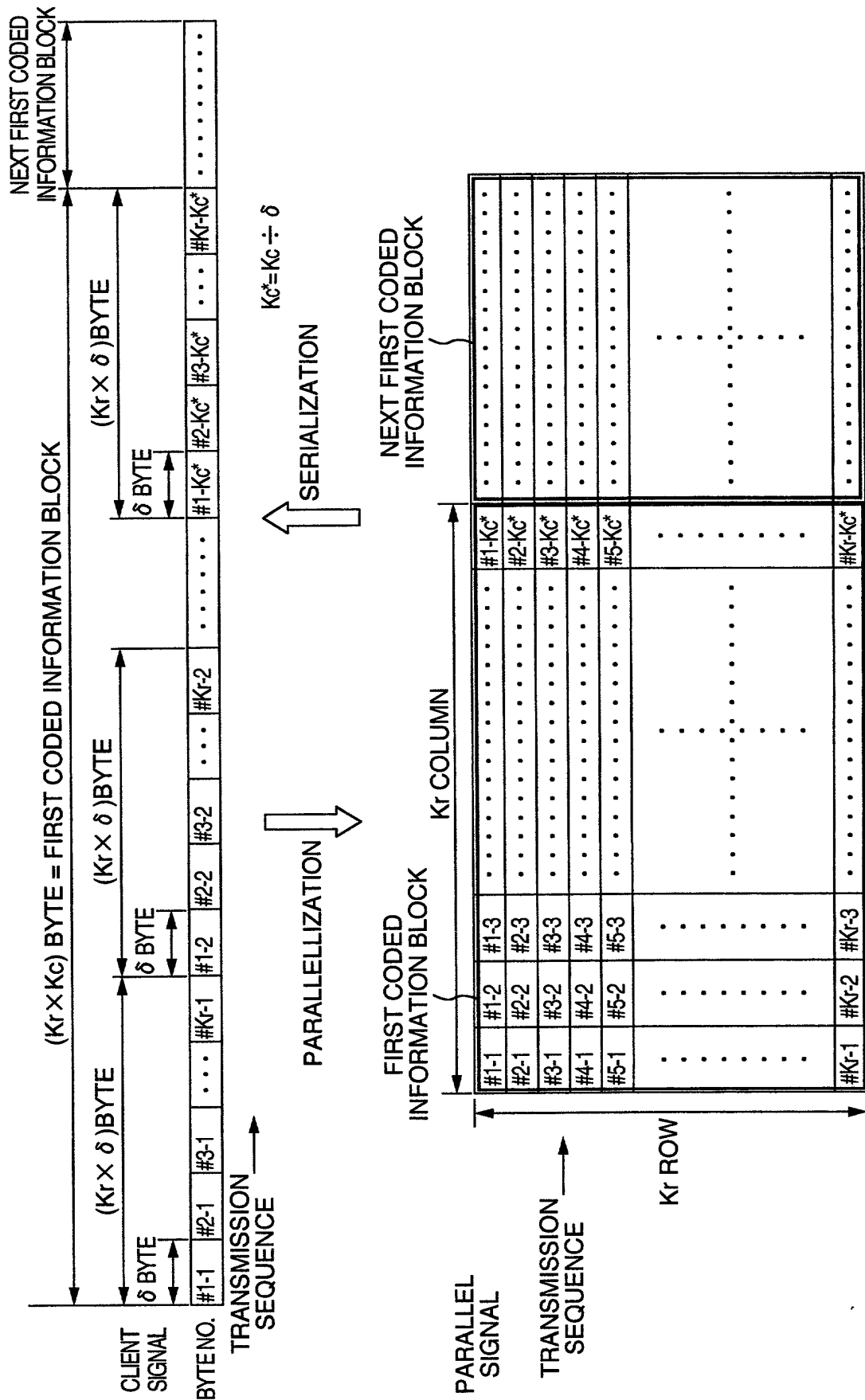


FIG.21

